



**ENGINEERS
AUSTRALIA**

**TRANSPORT, PLANNING AND THE BUILT
ENVIRONMENT
SUBMISSION TO THE GARNAUT REVIEW**

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1: INTRODUCTION

Engineers Australia is the peak body for engineering practitioners in Australia, representing all disciplines and branches of engineering. Membership is now approximately 83,000 Australia wide and Engineers Australia is the largest and most diverse professional engineering association in Australia. All Engineers Australia members are bound by a common commitment to promote engineering and to facilitate its practice for the common good.

Since 1989, Engineers Australia has had in place sustainable development principles to guide members in the conduct of their engineering practice. Sustainable development is an integral component of Engineers Australia's code of ethics which are agreed by all members. Engineers Australia has also formally endorsed a Sustainability Charter and a comprehensive policy on Australia's energy future and climate change.

Engineers Australia warmly welcomes the formal ratification of the Kyoto Protocol by the new Federal Government and other steps taken to put in place an enduring framework to achieve reductions in greenhouse emissions, including your review. In an earlier Submission, Engineers Australia highlighted the tenets and principles of its climate change and energy policy. This Submission elaborates on these matters in the context of the questions raised in the discussion paper on Transport, Planning and the Built Environment.

The issues raised in the discussion paper must be dealt with in the context of a long term emissions reduction target for Australia and an indicative pathway towards that target. Until Australians face up to what achieving emissions reductions means to their lives abstract debate will obscure the practical realities of what must be done. Engineers Australia believes that all sectors of the economy need to accept their share of the burden of emissions reduction. In this context Engineers Australia welcomes the Review giving consideration to emissions reduction issues in transport, planning and the built environment. Arguments for special consideration for any sector are not warranted on equity grounds. Having said that, Engineers Australia accepts that in the future experience and outcomes may indicate the need for some flexibility in this regard.

Engineers Australia fully accepts that the objective of emissions reduction policies should be to achieve cost effective, and preferably least cost approaches, to emission reduction. Engineers Australia believes that the Government's policy to implement energy and greenhouse reporting from mid 2008 and emissions trading from 2010 are the most appropriate basis for these objectives. However, emissions trading is not a panacea. There are numerous low cost or no cost options, notably energy efficiency options, which are not responsive to prices. Here the main impediments are non-price barriers. Research by the International Energy Agency shows that up to 45% of emissions reductions can result from energy efficiency options. The sectors covered by the present discussion paper are particularly important to target with energy efficiency approaches.

2: POLICY BARRIERS IN THE PASSENGER TRANSPORT SECTOR

Australia has one of the highest levels of energy use in passenger transport in the world. Although there has been a trend reduction in Australian energy use per passenger kilometer traveled averaged across all transport modes between 1990 and 2004, the

level of energy used is well above all International Energy Agency (IEA) countries other than the United States and Canada¹. Passenger car transport is a particularly high source of greenhouse emissions in Australia and these relationships also prevail in respect of the average fuel intensity of the Australian car stock² and trends in new car fuel intensity³.

Engineers Australia believes that transport sector policies to reduce greenhouse emissions, like other energy sectors should consider all options and be underpinned by comprehensive energy efficiency policies.

Engineers Australia agrees the absence of a carbon price may be one barrier to the uptake of more efficient passenger transport patterns. However, its impact is open to question. As the IEA noted in a Report to the G8, customers tend to buy cars on the basis of many factors and fuel efficiency is only one of these and is seldom the most important one⁴. This is reflected in a comparison between the National Average Fuel Consumption (NAFC) target and vehicle sales in Australia. The NAFC target aims to achieve fuel consumption of 6.8 litres per 100 kilometers traveled by 2010. However, the Federal Government's green vehicle web-site shows that in 2007 only 12% of vehicles offered in Australia met this voluntary target for popular vehicle categories which accounted 61% of 2006 vehicle sales. Not included in these figures were off road vehicles which accounted for a further 18% of sales with none meeting the fuel standard⁵.

The effect of emissions trading on fuel prices is likely to be similar to recent increases in fuel prices resulting from movements in world crude oil prices. There has been some movement towards the purchase of more efficient vehicles and some switching between car use and public transport. However, these changes have been at the margin because the availability of alternative modes of transport is poor and often offers significantly less convenience.

Engineers Australia does not believe that passenger transport should be excluded from emissions trading. The impact of rising fuel prices due to emissions trading in conjunction with rises resulting from continuing high world demand for oil and the emergence of peak oil pressures over coming years will be important but likely to be slower than the requirements of effective greenhouse reduction policies. Engineers Australia believes other policy initiatives will also be necessary, including;

- Consideration of including vehicle manufacturers and importers directly into emission trading arrangements. Plans announced to date indicate that fuel refiners and providers will be included in upstream emission permit arrangements and vehicle manufactures will be included, depending on the scale of their direct manufacturing emissions. However, vehicle manufacturers and importers could

¹ International Energy Agency, Energy Use in the New Millennium, Trends in IEA Countries, 2007, p110, www.iea.org

² Op cit, p111

³ Op cit, p113

⁴ International Energy Agency, Energy Technology Perspectives 2006, in Support of the G8 Plan of Action, 2006, p138, www.iea.org

⁵ Engineers Australia, Australia's Energy Future, Australian Energy Policy and Climate Change, 2007, pp52-3, www.engineersaustralia.org.au

also be included in emissions trading through a requirement that vehicles manufactured also have emission permits to cover the end disposal of the vehicle.

- When public transport services are provided or improved, experience shows that patronage improves, for example, the Smartbus in Melbourne's east. However, large increases in public transport will be needed because of the present low base. The absence of public transport infrastructure is a major barrier to more efficient passenger transport. An area where public transport policies could make significant gains is through enhanced network connectivity to serve a much greater range of origins and destinations. Similarly, encouraging the location of employment at locations where public transport routes converge would facilitate a shift away from cars. Finally, the convenience of private car use has resulted in significant increases in traffic congestion in most Australian cities. The arguments for congestion taxes to deal with this externality are the same as for carbon prices and will serve to rebalance incentives between cars and public transport. In the absence of satisfactory alternatives, congestion taxes are likely to be counter-productive.
- Australia needs a more comprehensive and effective approach to vehicle fuel efficiency. Continued reliance on a voluntary fuel efficiency target, which experience has demonstrated is being ignored by manufacturers, is no longer tenable. Australia needs a mandatory fuel efficiency target for all vehicles sold in Australia to counteract attitudes under which the choice of vehicle type and fuel efficiency is primarily made on non-economic grounds. Despite reluctance to embrace wider greenhouse emissions strategies, even the USA now has a mandatory energy efficiency target.
- Policies to improve the penetration of low emissions alternative fuels are needed. Australia's increasing reliance on imported oil will develop into an economic problem as well as an emissions problem. Fuel efficiency in combination with increasing the share of alternatives can address both issues. There is scope for expansion of biomass additives, there is scope for a shift towards diesel fuels as has occurred in Europe and there is scope for greater use of compressed natural gas.
- Just as there is a case for a mandatory renewable electricity target there is a case for support for the expansion of hybrid and other low or no emission vehicles in additions to the national vehicle fleet. Several technologies are commercial now and others are likely to be available in coming years. A low emission culture needs to replace the V8/SUV culture and price alone will not be enough to achieve this outcome.

3: LAND USE PLANNING AND THE BUILT ENVIRONMENT

Australian cities have developed around the availability of cheap land on city fringes and the availability of cheap private transport. Public transport is frequently dominated by radial patterns to the city centre including by rail services. Major changes will be necessary to redevelop cities to more sustainable forms and this is unlikely to be achievable in the short term.

Fundamental changes in long term urban planning will be needed. At present urban planning is not well connected with economic planning and planning for requirements

such as a low emissions future. Engineers Australia believes that the Federal Government can facilitate changes which encourage more efficient land use arrangements.

High stamp duties impede the mobility of people who wish to move in order to lessen their travel requirements. The scale of these duties favors additional travel and discourages housing mobility. Unless this impediment is overcome the status quo will change more slowly than efficient sustainability requires.

Apartments have become more popular in Australian cities as life style choices change. However, many planning laws and regulations impede higher property densities through reinforcement of out-moded single dwelling covenants. As the Australian economy becomes more focused on services, arguments formerly used to defend separation of residential from business precincts, which were often oriented to manufacturing, are less applicable.

4: COST EFFECTIVE EMISSIONS REDUCTIONS IN THE FREIGHT SECTOR

Contrary to popular belief, the energy intensity of Australian freight transport is the lowest in the IEA group of countries and has slowly trended downwards since 1990⁶. Similarly, there is greater balance between transport modes with trucks, rail and ships all increasing total freight tonnes kilometers between 1990 and 2004⁷. Never-the-less truck freight transport accounts for the bulk of energy use per tonne kilometer⁸. Underlying these features truck freight has experienced improvements in energy used per tonne kilometer and improvements in truck kilometers per tonne kilometers (that is greater efficiency in loads carried)⁹.

Engineers Australia does not believe that emissions trading will necessarily lead to cost effective emissions reductions in the freight sector without the support of other policies. The limitations of current transport infrastructure mean that in the short term only marginal changes to modal composition are possible. Existing railway lines serve limited markets. In the short term various ways to improve the efficiency of infrastructure, such as improved inter-modal coordination and by improving the efficiency of freight movements along shared freight/passenger corridors, are available and must receive the highest priority. Coastal shipping is also limited in scope. Road freight services the markets not addressed adequately, or at all, by rail and coastal shipping. Therefore the key short term challenge to cost effective emissions reductions is fuel efficiency and to some degree load efficiencies.

Section 2 included remarks on the importance of a fuel efficiency target. Although the evidence suggests that there have already been important improvements in Australian freight transport, more can be achieved by focusing attention on fuel efficiency through a formal target. As past achievements have indicated, further progress in improving the productivity of freight vehicles is also warranted.

⁶ IEA, Energy Use, op cit, p127

⁷ Op cit, p124

⁸ Op cit, p125

⁹ Op cit, p131

Over time changes can be made to infrastructure and to infrastructure access pricing. Proposals such as a very fast train line linking Brisbane-Sydney-Canberra-Melbourne to carry both freight and passenger train offers efficiency improvements not possible with existing infrastructure. Existing rail routes can be upgraded so that lines currently devoted to passenger transport can cope with the increased axle loads required by freight movements. Similarly, the capacity of lines to cope with higher train speeds and trains passing can be considered.

Cost neutrality in transport freight infrastructure access pricing is essential. The present approach to pricing lacks transparency is dependent on a formula which leaves many issues open to subjective decisions and is widely seen as controversial. Engineers Australia believes that both rail and road freight transport are vital to the efficiency of the Australian economy. Modal choice should be based on infrastructure costs and availability and economic pricing rather than ideological stands. This is widely accepted as not being the case at present and unproductive elements of the debate will be accentuated by the impact of emissions trading and rising fuel prices for whatever reason.

5: ENERGY EFFICIENCY OF BUILDINGS

Engineers Australia has argued strenuously in favor of adopting energy efficient practices in buildings for many years. Unlike in the transport sector, there have been a number of developments towards realizing the benefits of greater energy efficiency in buildings. Development of Stage 1 of the National Energy Efficiency Framework (NFEF) commenced in August 2004 and is due for completion in June 2008. The NFEF was based upon recognition that non-price barriers were far more important in achieving energy efficiencies than were price barriers¹⁰.

The discussion paper canvases many of these non-price barriers but does not include consideration of first up cost barriers. Many energy efficient options require a larger up-front outlay than less efficient options, even though the life cycle costs for the energy efficient options are cheaper. Many purchasing decisions are based on first up cost considerations whether it is building insulation or appliances. Given that building energy costs are such low shares of household expenditure, buyers will compare the immediate additional cost of energy efficient options to the small, and later, increment in energy bills that might arise from the less efficient option, if any economic comparison is made at all. Another issue is that in many instances the financial gains to individuals are too small to convince them to go to the trouble to change buying habits. Typically, the economy wide aggregate of these gains are materially important.

Typically, combinations of non-price barriers apply in individual cases. The circumstances point to the need for regulation and information policies. The arguments used to support the establishment of the NFEF are still applicable. The implementation of emissions trading may have a marginal impact, but is unlikely to address the substantive problem.

Engineers Australia believes that the case used to establish the NFEF and the elements of the framework remain sound, now and for the future. However, implementation has

¹⁰ www.nfee.gov.au

been too slow, inconsistent, unduly focused on new activity and in the case of appliances, based on minimum standards rather than best practice standards.

There are major implementation issues arising from unnecessary differences between jurisdictions. By May 2006 the Building Code of Australia had been amended to incorporate 5 star energy efficiency provisions for residential and commercial buildings. However, the Building Code of Australia is simply a model code for jurisdictions to consider and not as a template for uniform implementation. There have been several departures from the Building Code of Australia, with States and Territories implementing their preferred views, causing confusion and undermining concerted Australia wide action.

Recent data on Australia's housing stock is not yet available. Data from the 2001 Census indicates that at that time the stock was 7,367,000 dwellings and that over the previous year 133,900 new dwellings were built. Not all new construction was replacement of demolished older houses. These figures suggest that reliance on enhanced energy efficiency standards is inadequate. Engineers Australia believes that persisting with this approach would be unfortunate because it is unlikely to result in timely and significant emissions reductions in the medium term.

The NFEES has established Minimum Energy Performance Standards for refrigerators, freezers, electric hot water systems and for refrigerative air conditioners. This is very slow progress because the information required to set minimum standards has been well known for some time and because so few appliances have been included in the arrangement. Engineers Australia believes that progress needs to be accelerated to include all common appliances within the next two years. Engineers Australia also believes that setting minimum standards sets the bar too low. A better alternative is to move from minimum standards to best practices benchmarking as has been done in California¹¹.

Improved consumer information on the importance and value of energy efficiency is vital. This is where specific icon changes, such as switching from incandescent to fluorescent lighting can facilitate message penetration.

There are numerous subsidies available from the Federal and State and Territory governments to adopt energy efficiency measures. The extent of the subsidies and applications which are eligible vary widely between jurisdictions. There is little consistency in eligible applications and subsidy amounts. Some subsidies, for example, subsidies for the installation of photo-voltaic systems are counteracted by unfavorable feed-in tariffs by local utilities. Engineers Australia believes that incentives have an important role to play in lifting the penetration rate of energy efficient options. More consistency in eligible applications, for example, a focus on retro-fitting insulation, in subsidy levels and the relationship between subsidy levels and market and consumer circumstances are necessary. Developments in this area will benefit considerably from economy wide modeling to establish the relative effectiveness of options to ensure more cost effective and focused targeting.

In summary, Engineers Australia believes that there is considerable merit in building on the work already achieved under the NFEES. To fully take advantage of the low cost

¹¹ www.eebestpractices.com

options for reducing greenhouse emissions Engineers Australia believes that a more vigorous, innovative and timely approach to NFEI implementation is essential.